Headquarters U.S. Air Force

Integrity - Service - Excellence

Thoughts on the Future of Wargaming

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AF/A8XC

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- **What's in a wargame?**

- **The current state of wargaming**

- **Points of departure / innovation on the edge**

- **A vision of tomorrow's wargame**

- **What else could this stuff be good for?**

  - "Throughout history new technologies tend to first be used to do old tasks better, only after some time do some people realize that the greatest value of that new technology is to do something entirely different"

- **When you need the discipline of a thinking Red, (the human dynamic of intention, adaptation and invention)**
  - **As an analytical tool, a wargame is distinct from other exercises and analytical tools such as studies, interviews, models by the discipline of a self-interested, thinking, adaptive red.**
  - **When we require insight into the human element**
- **Good for questions like**
  - **How would red see / react to this action?**
  - **Which of these two would I rather have / do?**
  - **Is this something I would really want to attempt?**
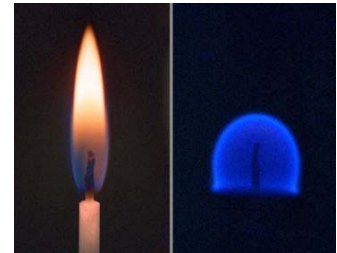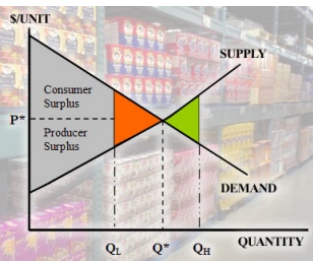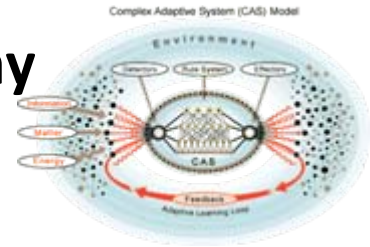 - **What might happen if? (Discovery)**
    - **Unknown Unknowns, new phenomena**

- **A-Ha's: Insight into effective methods of perceiving or conducting conflict. Opportunity.**

- **U-Oh's:! Insight that an existing action or method is not going to cut it in the forecast environment. Trouble lies ahead.**

- **Ooops: That was dumb. Glad I did it in the wargame rather than reality**

- **Hmm's: Insight that there is an emergent class of phenomena that is insufficiently understood**

What is a wargame good for?

- **Answer:** How should I adapt myself and my actions to survive, grow, and improve my capacity for independent action?

- Simulated experience and mistakes

- Appreciation of complexities, governing dynamics

- Known factors with an unknown elements "does it still work, what has changed?"

- An unknown element against known elements "What does this mean?"

- Unknown elements with unknown elements "How will all this sort out" (Directed Energy vs. Hypersonic Missiles)

Sometimes, as in a complex system, you have multiple changing variables and unknown and novel elements that must all be mixed at once.

What will it do?
That's Futures Game

When unknown elements combine... unpredictable things happen

State changes. Result in stability? What is constant? What changes? What is predictable?
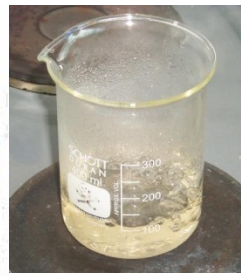

Just Sit there? **Mix?** **Change Color?** **Bubble?** **Glow?** **Smoke?** **Fire?** **Explode?**
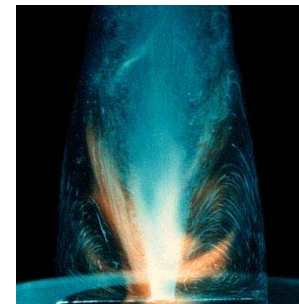

Complex phenomena, unexpected results, discovery of <u>Unknown-unknowns</u> & the <u>creation of novelty</u>

A Wargame is in the mind of the player, but…

- **What are we putting into that mind?**
- **Is there benefit to a close mapping between certain elements in wargaming?**
  - **Appreciation of time, distance, timing, difficulty?**
  - **Understanding of the true time pressures of their own OODA loop?**
    - **Real time is DIFFERENT than turn-based!**

- **Little more than a "BOGSAT" with:**
  - **Maps, moves, and spreadsheets**
  - **Cumbersome, turn-based, *not* point & click, *not* model adjudicated**
  - **Minimally supporting, largely unlinked models**
  - **Not "real time" (by default, not by choice)**
  - **No lower-level commanders**
- **System complexity is not well understood**
  - **Not logistics informed, fuel and lift "like air"**
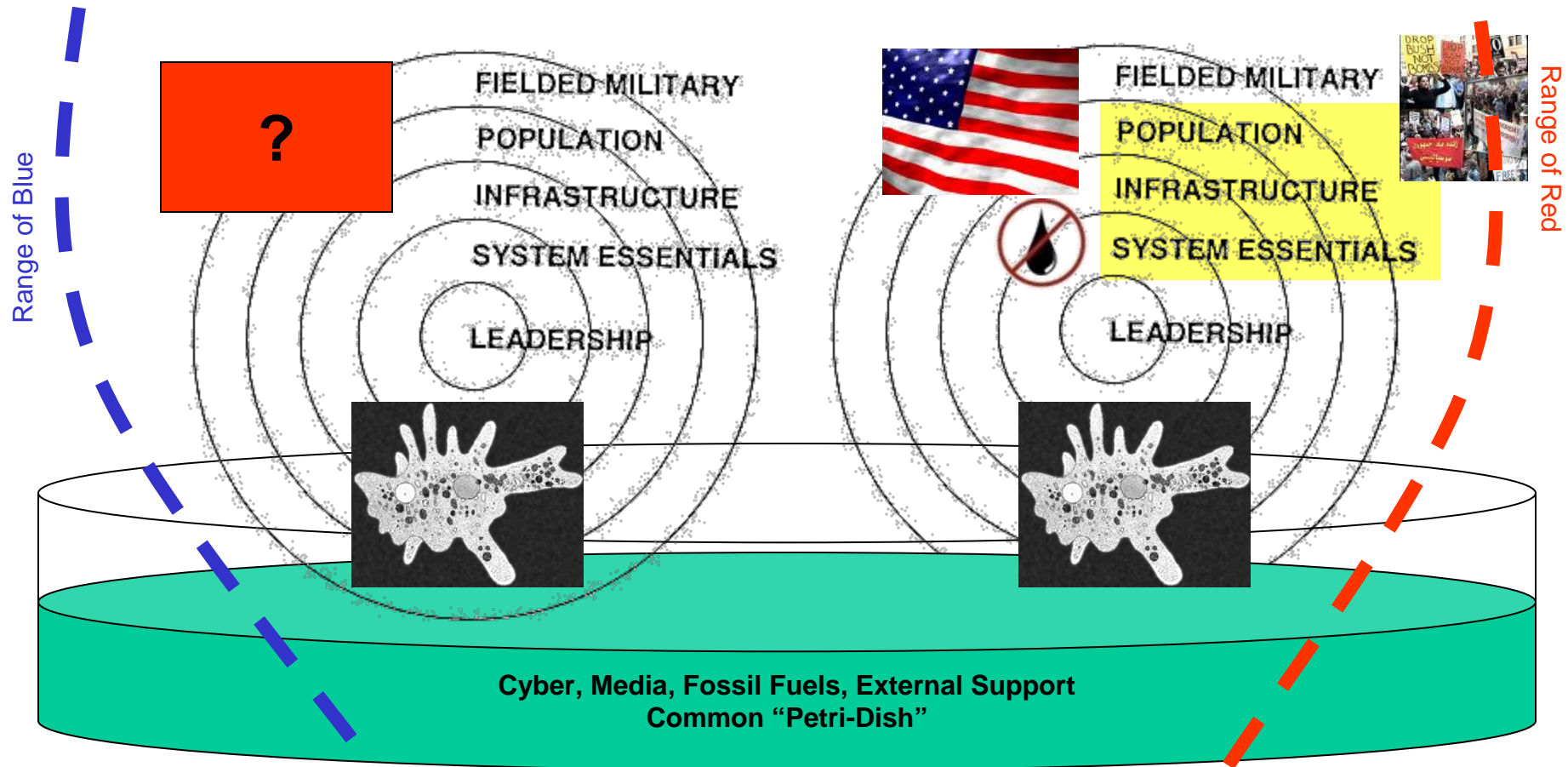 - **Where modeled, based on attrition, not maneuver**

FIELDED MILITARY

POPULATION

INFRASTRUCTURE

SYSTEM ESSENTIALS

LEADERSHIP
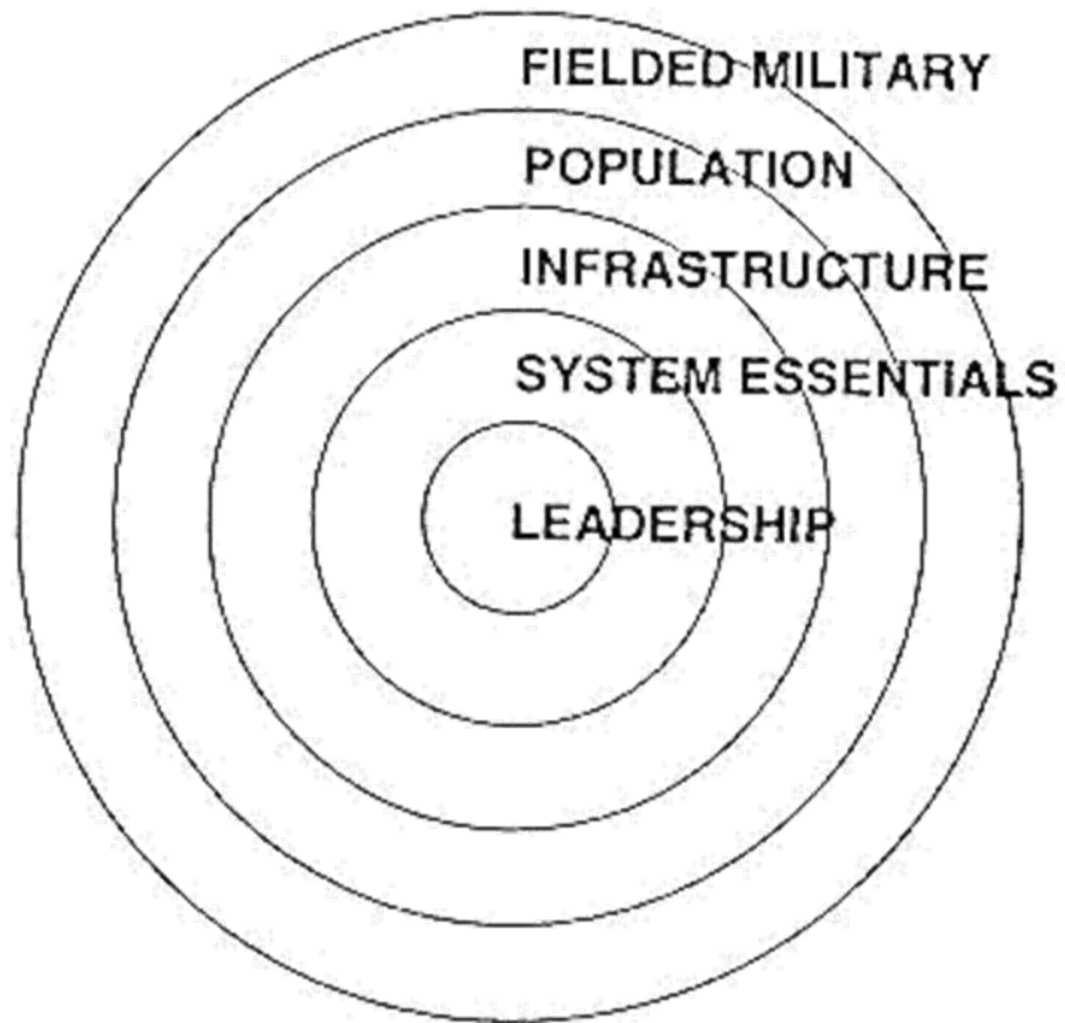
We have nothing like this modeled!

We Need to be able to play System against System
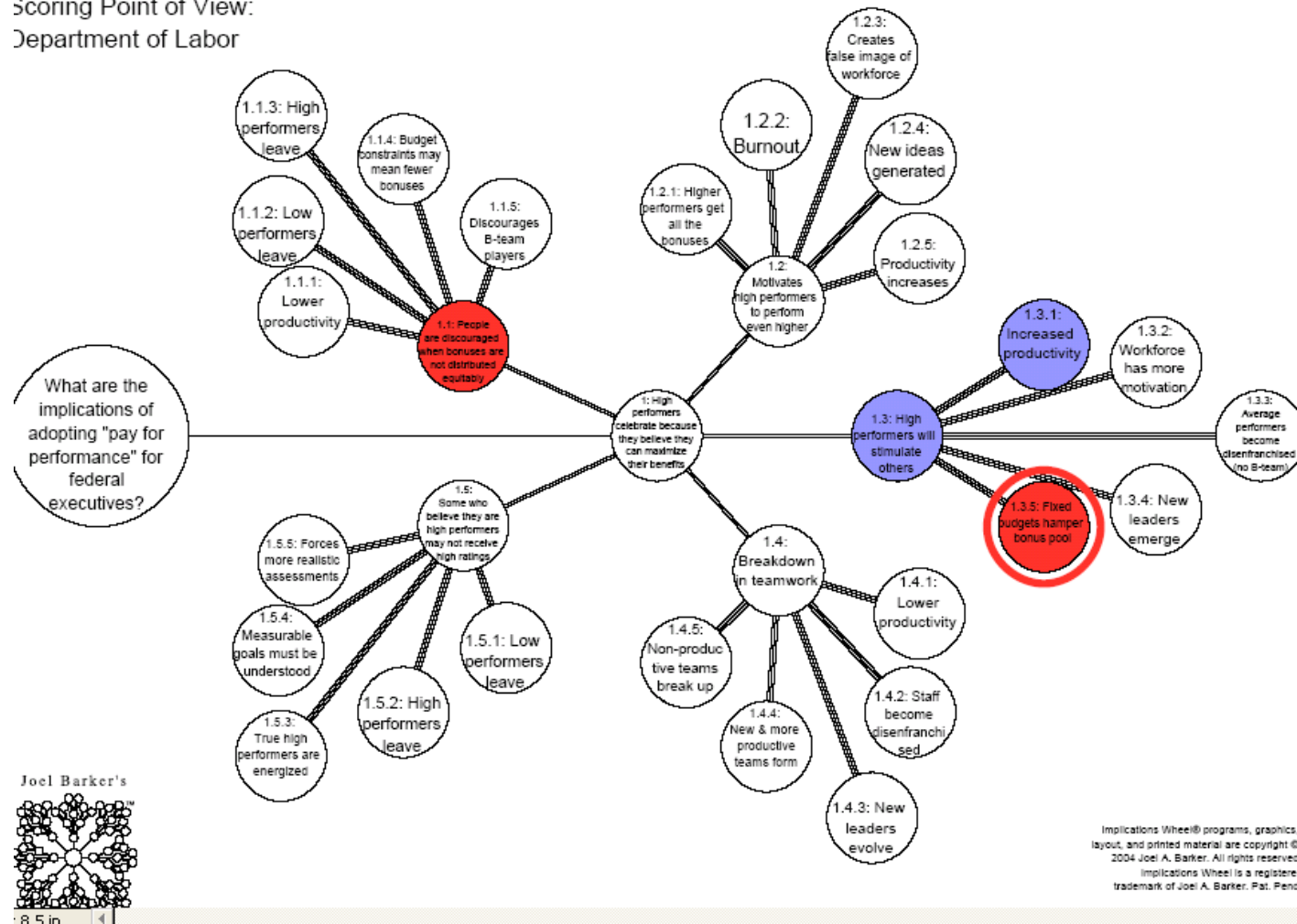
Wargaming is Specific tool in the Spectrum of Decision Support

Decision Support: Strategic Planning, Policy & Force Structure

Decision Support Ends (What is worthy & achievable?)

Decision Support Means (What is the best way to get it?)

Decision Support: Operational Planning

Decision Support Ends (What is attainable?)

Wargames

Decision Support Means (How shall we attain it?)

•**Organization, Force Structure, CONOPS**

Decision Support: Training

Training in Individual Skills

Training & Exercising in Group Skills

Decision Support: Execution in Real Time

Selection Among Alternatives

Faster-than-Real-time Forecasting

Linking of Live, Virtual and Constructive Worlds

Points of Departure for Expansion

Linked Sims COPOEX

CPE

Real-time & Turn-based Strategy Games

Social Games & Helical Training

National Decision-making game

MMOG

Social Networks

Virtual Spaces

Augmented & Mixed Reality

Mirror Worlds

Ambush

RealWorld

Constructive

Virtual

Live
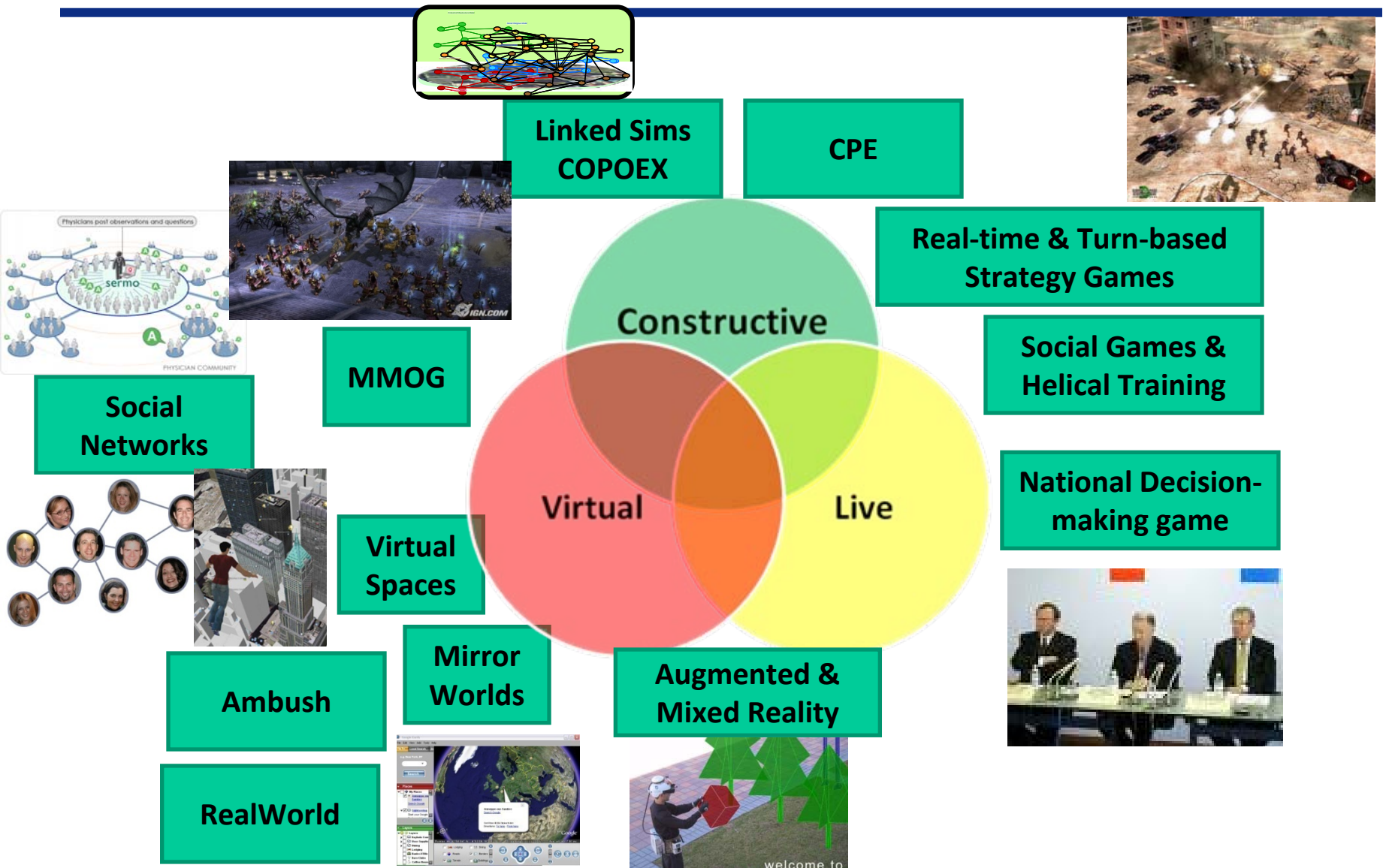
Tomorrows wargames may include:

- **Many more smart agents / synthetic warriors**

- **Decision / Prediction markets**

- **Artificial-Artificial intelligence (Open source participation)**

- **Make use of Grid / Cloud computing**

- **The ability to generate a "history of the future" from complex interlined models**

- **The ability for many people to play the protagonist and be scored against one another**

- **Tight geospatial integration with open source data (such as Google Earth & lie weather / traffic feeds)→Scenario agility**

- **Instability forecasted with "grown" scenario**
- **Model Adjudicated**
- **Entity level**
- **Agent Grown infrastructure & logistics**
- **Linked underlying models**
- **Distributed & multi-level MMOG w/LVC plug-ins**

- **And "Let a thousand flowers bloom" of individual decision & education "mod" games for PME & Decision Support**

What else could this be good for?

- **Train in variety & complexity to establish mutual trust, and sophisticated understanding of causality**

- **Distributing intelligence into the institution**
  - **Each agent gains strategic insight**
    - **Informed resource & optimization functions**
  - **User created tools, "mods," on-the-fly content**

- **Identify & train commanders: Ender's Game**

- **Deterrence: Show the enemy the future**

- **Predict instability far in advance & apply "institutional acupuncture"**
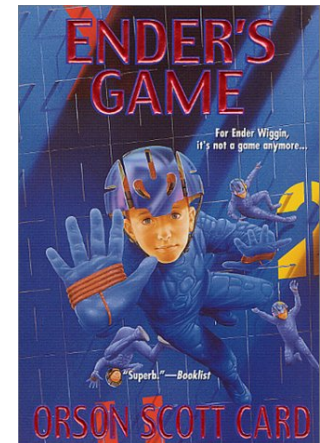
Taking the simulation into the battle

- **Turning games into forecasts**
- **Forecasting where**
- **Faster-than-real-time what may happen**
- **Explore and pare decision trees**
- **Better C2 interfaces**
  - **Point & Click to task**
  - **Fight as you train**

- **We will discover a new set of important phenomena that is not properly modeled**
  - **Because the map is not the territory**
  - **Uncertainty and Novelty are fundamental**
- **We will move on and try to model those**

All attempts to model such complexity are hubris, and are subject to spectacular failure, but we must attempt them anyway because we must have schema to operate.

***All* models are wrong, but *some* are useful.**